AMENDMENTS TO THE CLAIMS

The listing of claims presented below will replace all prior versions and listings of claims in the application.

Listing of claims:

1. (**currently amended**) An inter-frame wavelet coding apparatus, comprising:

a Motion Compensated Temporal Filtering (MCTF) unit for computing [[a]] motion vectors of a group of pictures (GOP)**,** and **performing a lowpass** filtering **and a highpass filtering** the GOP with respect to ~~the~~ **a first** temporal axis **using the motion vectors**, ~~to thereby~~ **in order to** obtain **a lowpass and a highpass** filtered ~~frame~~ **frames;**

wherein the MCTF unit performs the lowpass filtering and the highpass filtering on the lowpass filtered frame of the first temporal axis for at least one or more second temporal axis;

a wavelet transforming unit for performing spatial wavelet transform on **each of** the **highpass** filtered ~~frame~~ **frames and a final lowpass filtered frame** and outputting [[a]] wavelet coefficient**s of each temporal level for each of the highpass filtered frames and the final lowpass filtered frame**;

a quantization unit for quantizing the wavelet coefficient**s**;

an entropy coding unit for entropy-coding the motion vector**s** ~~computed in the MCTF unit~~ and the quantized wavelet coefficient**s**, ~~to thereby~~ **in order to** generate an entropy-coded bit stream; and

a wavelet filter managing unit for selecting a decomposition level and a filter length for the wavelet transforming unit based on motion estimation information of the GOP**, which are obtained by performing the lowpass filtering and the highpass**

filtering the GOP in the MCTF unit; ~~video computed in the MCTF unit,~~

wherein the wavelet filter managing unit respectively selects the

decomposition level and the filter length for each of the highpass filtered frames

and the final lowpass filtered frame;

wherein the decomposition level and the filter length for each of the

highpass filtered frames are selected properly to the amount of information of

each frame based on the motion estimation information;

wherein the decomposition level and the filter length for the final lowpass

filtered frame are selected a maximum decomposition level and a maximum filter

length;

wherein the decomposition level and the filter length are included in the entropy-

coded bit stream.

2. (**currently amended**) The inter-frame wavelet coding apparatus as recited in

claim 1, wherein ~~the MCTF unit performs lowpass filtering and highpass filtering~~

~~on a lowpass-filtered frame repeatedly, and~~ the wavelet filter managing unit selects ~~a~~

~~decomposition level and a filter length for the wavelet transforming unit based on~~

~~the information amount of the filtered frame~~ **the decomposition level and the filter**

length based on a computing capability of a decoding apparatus to minimize a

decoding computation of the decoding apparatus by having an optimum

computation amount.

3. (**currently amended**) The inter-frame wavelet coding apparatus as recited in

claim [[2]] **1**, wherein the wavelet transforming unit includes:

a first wavelet transformer having **a** **the** maximum decomposition level and **a** **the** maximum filter length, [[for]] **and** wavelet-transforming **a** **the** final lowpass-filtered frame; and

a second wavelet transformer having a decomposition level and a filter length equal to or smaller than the decomposition level and the filter length of the first wavelet transformer, **and** wavelet-transforming ~~the rest highpass-filtered GOP frames~~ **each of the highpass filtered frames**.

4. (original) The inter-frame wavelet coding apparatus as recited in claim 3, wherein the wavelet filter managing unit selects a 9/7 filter having a three or four-stage decomposition level as the first wavelet transformer.

5. (original) The inter-frame wavelet coding apparatus as recited in claim 3, wherein the wavelet filter managing unit selects a 5/3 filter having a three or four-stage decomposition level as the first wavelet transformer.

6. (original) The inter-frame wavelet coding apparatus as recited in claim 3, wherein the wavelet filter managing unit selects a Haar filter having one-stage decomposition level as the second wavelet transformer.

7. (**currently amended**) An inter-frame wavelet encoding apparatus, comprising:

a Motion Compensated Temporal Filtering (MCTF) ~~an MCTF~~ unit for

computing motion vectors of ~~performing~~ a group of pictures (GOP)**,** and **repeatedly**

performing a lowpass filtering and **a** highpass filtering the GOP with respect to ~~the~~ **a**

first temporal axis **using the motion vectors, in order to obtain a lowpass and a**

highpass filtered frames; ~~and performing lowpass filtering and highpass filtering~~

~~on a lowpass-filtered frame repeatedly~~

   wherein the MCTF unit performs lowpass filtering and highpass filtering on

the lowpass filtered frame of the first temporal axis for at least one or more

second temporal axis;

   a first wavelet transformer having a maximum decomposition level and a

maximum filter length, **[[for]] and** wavelet-transforming a final lowpass-filtered frame;

   a second wavelet transformer for each of the highpass filtered GOP frames

   a second wavelet transformer having a decomposition level and a filter length

equal to or smaller than the decomposition level and the filter length of the first wavelet

transformer, **[[for]] and** wavelet-transforming ~~the rest highpass-filtered GOP frames~~

each of the highpass filtered frames;

   a quantization unit for quantizing wavelet coefficients **of each temporal level for**

each of the highpass filtered frames and the final lowpass filtered frame; and

   wherein the wavelet coefficients are outputted from the first and second

wavelet transformer **by the wavelet-transforming**; **[[and]]**

   an entropy coding unit for entropy-coding the motion vector**s** ~~computed in the~~

~~MCTF unit~~ and the **quantized** wavelet coefficient**s;** ~~quantized in the quantization unit~~.

   wherein the decomposition level and the filter length of the first and

second wavelet transformer are controlled based on motion estimation

information of the GOP, which are obtained by performing the lowpass filtering

and the highpass filtering the GOP in the MCTF unit;

     wherein the decomposition level and the filter length of the second wavelet

transformer for each of the highpass filtered frames are controlled properly to the

amount of information of each frame based on the motion estimation information;

     wherein the decomposition level and the filter length of the first wavelet

transformer for the final lowpass filtered frame are controlled the maximum

decomposition level and the maximum filter length.

8.   (original) The inter-frame wavelet coding apparatus as recited in claim 7, wherein

the first wavelet transformer includes a 9/7 filter having a three or four-stage

decomposition level.

9.   (original) The inter-frame wavelet coding apparatus as recited in claim 8, wherein

the first wavelet transformer includes a 5/3 filter having a three or four-stage

decomposition level.

10.   (original) The inter-frame wavelet coding apparatus as recited in claim 8, wherein

the second wavelet transformer includes a Haar filter having a one-stage decomposition

level.

11. (**currently amended**) An inter-frame wavelet video decoding apparatus,

comprising:

an entropy decoding unit for entropy-decoding bit stream including information on

a decomposition level and a filter length for inverse wavelet transform;

an inverse quantization unit for inverse quantizing **[[a]]** quantized wavelet

coefficient**s** which is outputted from the entropy decoding unit;

an inverse wavelet transforming unit for performing wavelet transform on the

wavelet coefficient**s** outputted from the inverse quantization unit based on the

decomposition level and the filter length; and

a Motion Compensated Temporal Filtering (MCTF) combining unit for performing

MCTF combination on **[[a]]** motion vector**s** of the entropy decoding unit**, and**

outputting a group of pictures (GOP);

wherein the GOP is performed a lowpass filtering and a highpass filtering

with respect to a first temporal axis using the motion vectors based on the MCTF,

in order to obtain a lowpass and a highpass filtered frames;

wherein the GOP is performed the lowpass filtering and the highpass

filtering on the lowpass filtered frame of the first temporal axis for at least one or

more second temporal axis

wherein the decomposition level and the filter length for each of highpass

filtered frames and a final lowpass filtered frame are respectively controlled

based on motion estimation information of the GOP;

wherein the decomposition level and the filter length for each of the

highpass filtered frames are controlled properly to the amount of information of

each frame based on the motion estimation information;

wherein the decomposition level and the filter length for the final lowpass

filtered frame are controlled a maximum decomposition level and a maximum

filter length.

12. (**currently amended**) An inter-frame wavelet coding method, comprising the

steps of:

a) **computing motion vectors of a group of pictures (GOP), and performing**

Motion Compensated Temporal Filtering (MCTF) the GOP;

wherein the MCTF performs a lowpass filtering ~~an inputted group of pictures~~

~~(GOP) video~~ **and a highpass filtering the GOP** with respect to [[the]] **a first** temporal

axis **using the motion vectors**, ~~to thereby~~ **in order to** obtain **a lowpass and a**

highpass filtered frames**;**

wherein the MCTF performs the lowpass filtering and the highpass filtering

on the lowpass filtered frame of the first temporal axis for at least one or more

second temporal axis;

b) performing spatial wavelet transform on **each of** the **highpass** filtered frame**s**

and a final lowpass filtered frame, and outputting wavelet coefficients of each

temporal level for each of the highpass filtered frames and the final lowpass

filtered frame;

c) quantizing [[a]] **the** wavelet coefficient**s;** ~~generated during the wavelet~~

~~transform of the step b);~~

d) performing entropy-encoding on [[a]] **the** motion vector**s** ~~computed in the~~

~~MCTF process of the step a)~~ and the **quantized** wavelet coefficient**s,** ~~quantized in~~

~~the quantization process of the step c), to thereby~~ **in order to** generate an entropy-

coded bit stream;

e) selecting a decomposition level and a filter length for the **spatial** wavelet

transform based on motion estimation information of the GOP **obtained by** ~~computed~~

~~in~~ the MCTF ~~process of the step a)~~; and

f) including information on the decomposition level and the filter length in the

entropy-coded bit stream**;**

wherein the step e) respectively selects the decomposition level and the

filter length for each of the highpass filtered frames and the final lowpass filtered

frame;

wherein the decomposition level and the filter length for each of the

highpass filtered frames are selected properly to the amount of information of

each frame based on the motion estimation information;

wherein the decomposition level and the filter length for the final lowpass

filtered frame are selected a maximum decomposition level and a maximum filter

length.

13. (**currently amended**) The inter-frame wavelet coding method as recited in claim

12, wherein ~~the step a) includes the step of a1) performing lowpass filtering and~~

~~highpass filtering on a lowpass-filtered frame repeatedly, and~~

~~in~~ the step e) ~~the decomposition level and the filter length are selected~~

~~based on the information amount of the filtered frame~~ **selects the decomposition**

level and the filter length based on a computing capability of a decoding

apparatus to minimize a decoding computation of the decoding apparatus by

having an optimum computation amount.

14. (**currently amended**) The inter-frame wavelet coding method as recited in claim

[[13]] 12, wherein the step b) includes the steps of:

b1) performing wavelet transform on **[[a]] the** final lowpass-filtered frame by

using a first wavelet transformer ~~having a~~ **which has the** maximum decomposition

level and ~~a~~ **the** maximum filter length; and

b2) performing wavelet transform on **each of the highpass filtered frames** ~~the~~

~~rest GOP frames~~ by using a second wavelet transformer**, which has** ~~having a~~

decomposition level and a filter length equal to or smaller than the decomposition level

and the filter length of the first wavelet transformer.

15.   (original) The inter-frame wavelet coding method as recited in claim 14, wherein

in the step e) a 9/7 filter having a three or four-stage decomposition level is selected as

the first wavelet transformer.

16.   The inter-frame wavelet coding method as recited in claim 14, wherein in the step

e) a 5/3 filter having a three or four-stage decomposition level is selected as the first

wavelet transformer.

17.   (original) The inter-frame wavelet coding method as recited in claim 14, wherein

in the step e) a Haar filter having a one-stage decomposition level is selected as the

second wavelet transformer.

18. (**currently amended**) An inter-frame wavelet decoding method, comprising the

steps of:

a) performing entropy-decoding on bit stream including information on a

decomposition level and a filter length for inverse wavelet transform;

b) inverse-quantizing **[[a]]** quantized wavelet coefficient**s** generated in the step

a);

c) performing inverse wavelet transform on **[[a]]** wavelet coefficient**s** generated in

the step b) based on the information on the decomposition level and the filter length;

and

d) performing a Motion Compensated Temporal Filtering (MCTF) combination

based on **[[a]]** motion vector**s** obtained in the step a)**, and outputting a group of**

pictures (GOP);

wherein the GOP is performed a lowpass filtering and a highpass filtering

with respect to a first temporal axis using the motion vectors based on the MCTF,

in order to obtain a lowpass and a highpass filtered frames;

wherein the GOP is performed the lowpass filtering and the highpass

filtering on the lowpass filtered frame of the first temporal axis for at least one or

more second temporal axis

wherein the decomposition level and the filter length for each of highpass

filtered frames and a final lowpass filtered frame are respectively controlled

based on motion estimation information of the GOP;

wherein the decomposition level and the filter length for each of the

highpass filtered frames are controlled properly to the amount of information of

each frame based on the motion estimation information;

     wherein the decomposition level and the filter length for the final lowpass

filtered frame are controlled a maximum decomposition level and a maximum

filter length.